PREPARATION AND EVALUATION OF AN ANTIBACTERIAL DENTAL CEMENT

Voon Joe Chong, Yiming Weng, Xia Guo, Leah Howard, Richard L. Gregory[1] (Dong Xie), Department of Biomedical Engineering, Purdue School of Engineering and Technology, Indiana University–Purdue University Indianapolis, Indianapolis, Indiana 46202

Objectives: The objective of this study was to develop an antibacterial cement and evaluate its mechanical strength and antibacterial activity. **Methods:** The newly synthesized quaternary ammonium bromide (QAB)-containing antibacterial polymers were initially evaluated using a MIC/MBC test and then incorporated into Fuji II LC cement. Compressive strength (CS) and viabilities of oral cavity-producing bacteria S. mutans and lactobacillus were used to evaluate the mechanical strength and antibacterial activity of the cement, respectively. Flexural (FS) and diametral tensile strengths (DTS) were tested as well. The specimens were conditioned in distilled water at 37 ^{o}C for 24 h prior to testing. **Results:** The cement showed a significant antibacterial activity to both oral bacteria, accompanying with an initial CS reduction. The effects of chain length and loading of the QAB were significant. **Conclusions:** It was found that the antibacterial effect of the substitute chain lengths from free QAB seem more significant in water than those from their polymers after integrating to the cement. It was also found that the antibacterial activity against lactobacillus was higher than that against S. mutans.

[1]Department of Oral Biology, Indiana University School of Dentistry, Indianapolis, IN 46202

This work was sponsored by NIH challenge grant (RC1) DE020614.